

Figure 1

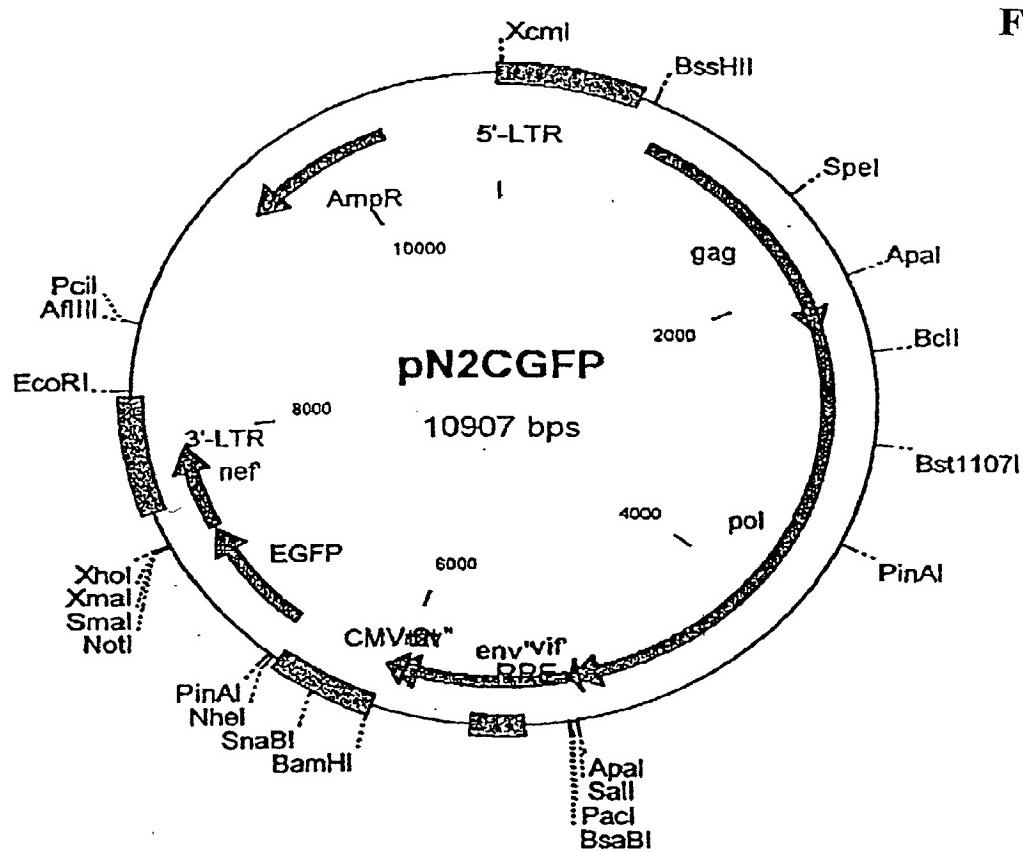
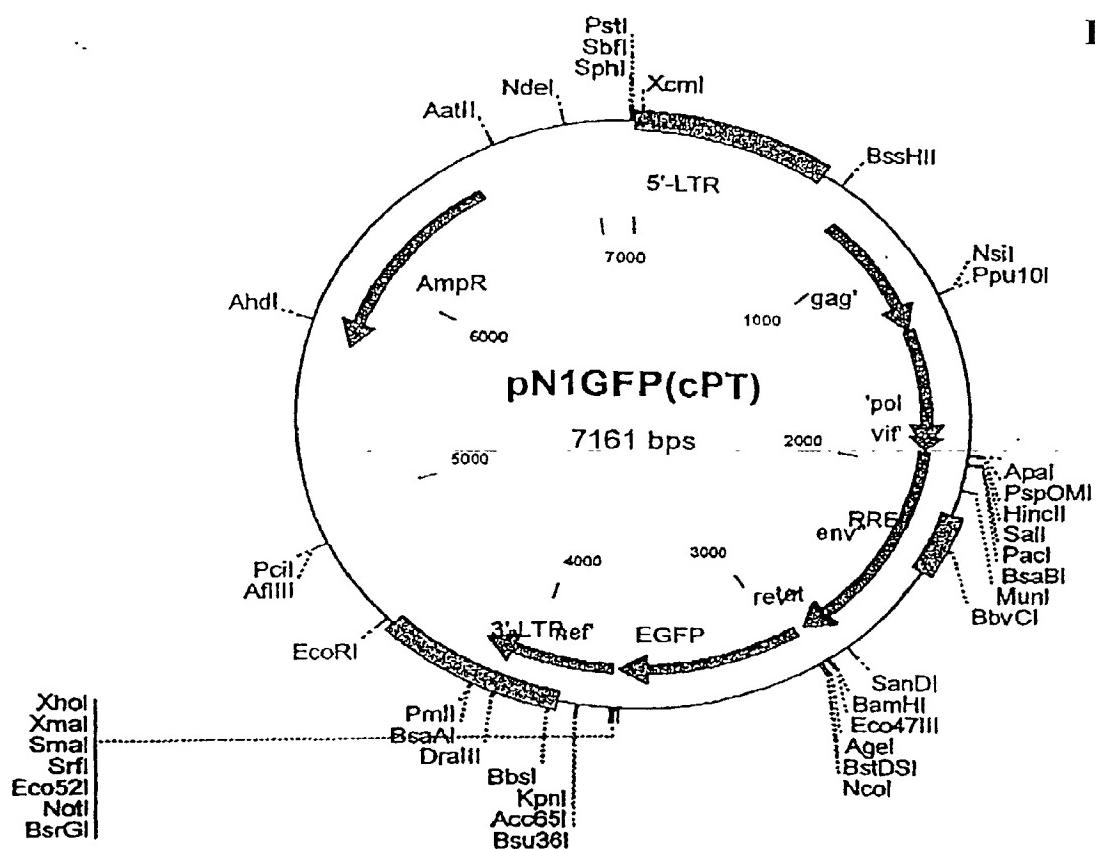
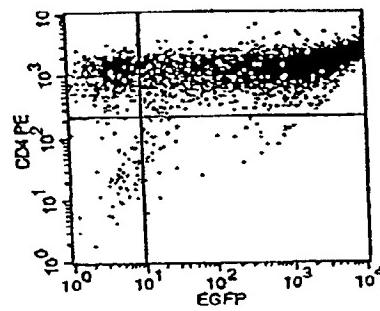


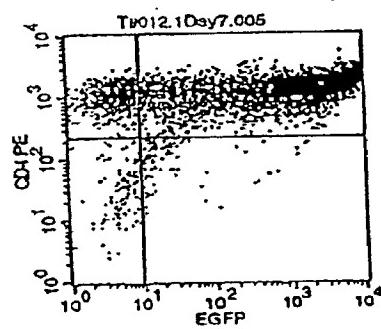
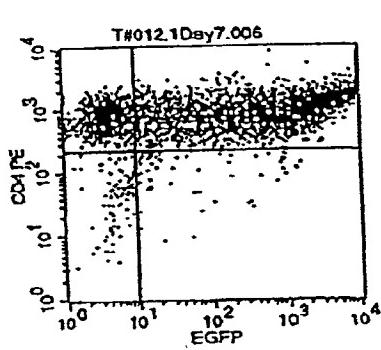
Figure 2A

Figure 2B

PCT/US06/19709

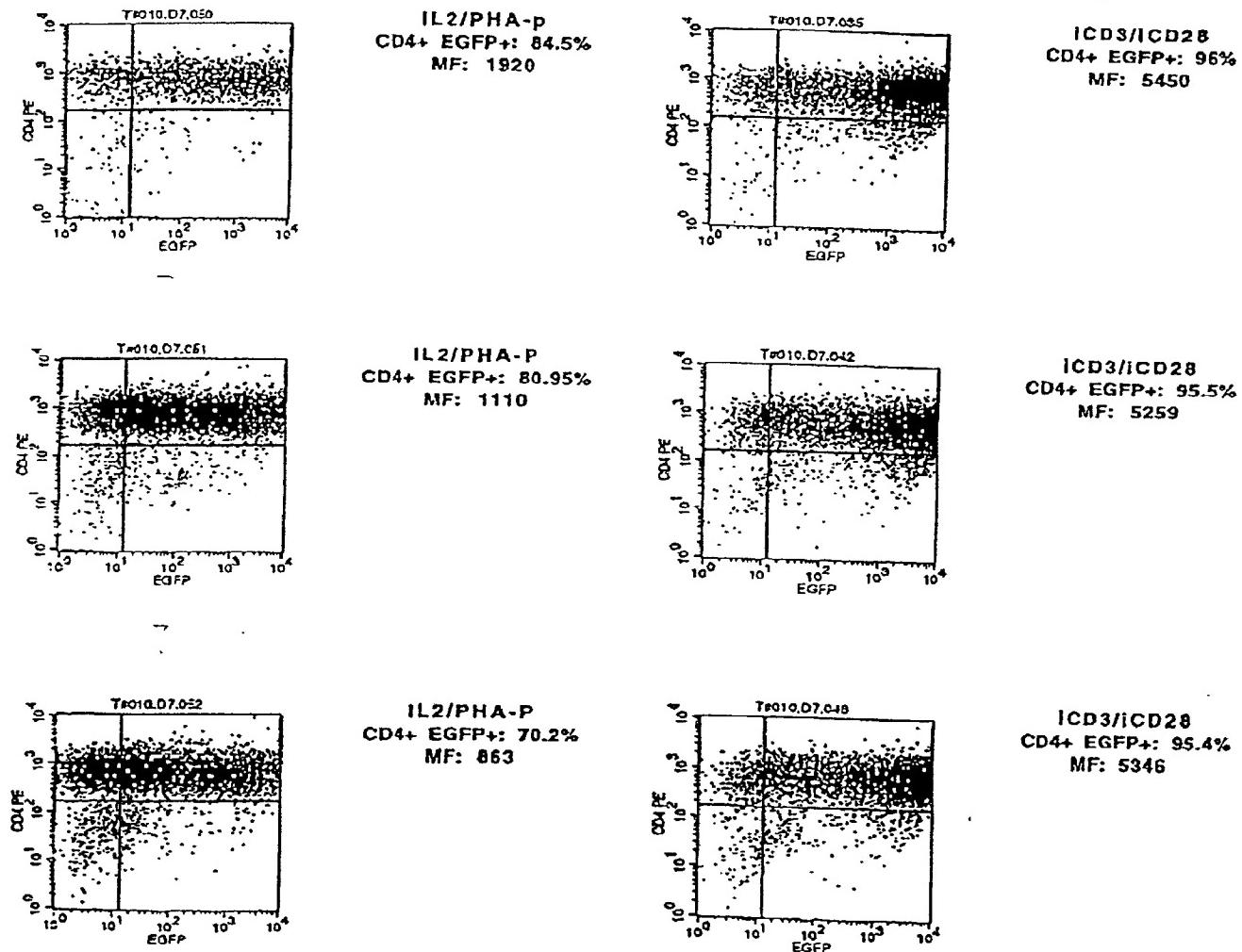
Figure 3*Panel A*

Stimulation Day 1

CD4+ EGFP+: 91.22%
MF: 3325*Panel B*Stimulation Day 0
Transduction Day 1CD4+ EGFP+: 89.12%
MF: 2962*Panel C*Stimulation Day 0
Transduction Day 0CD4+ EGFP+: 80.24%
MF: 1966

397272001540
PC 1 > UGCGG / 1.0 / 009

Figure 4



PCT/US06/19709

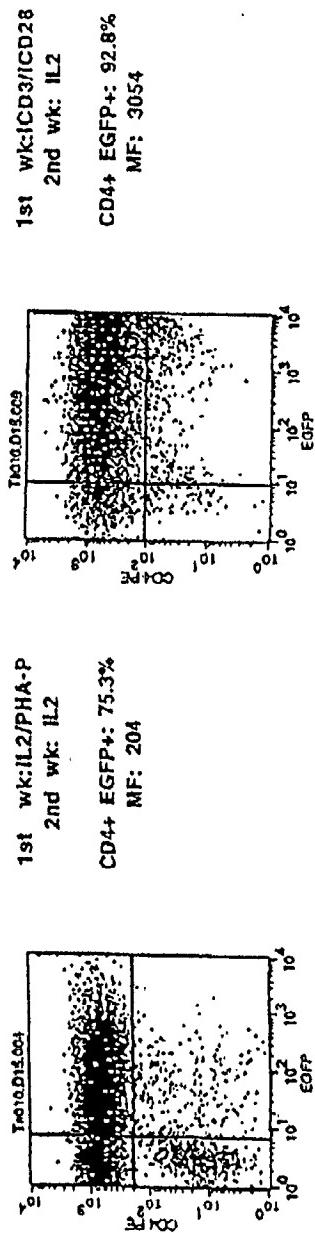


Figure 5

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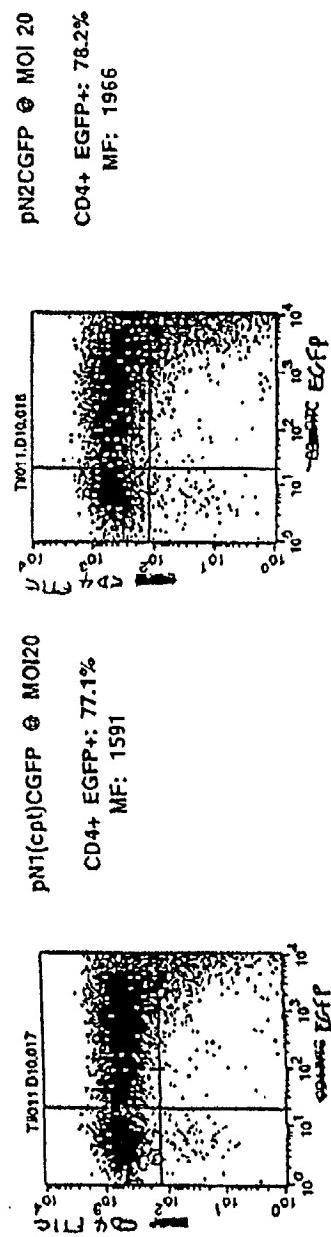
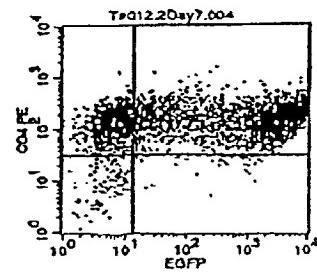


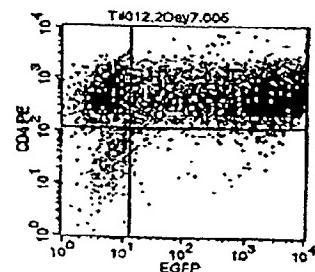
Figure 6

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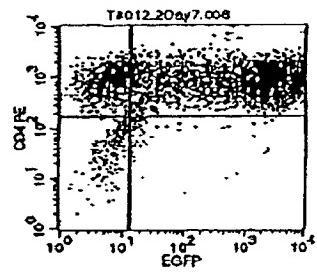
PCT/US06/19709



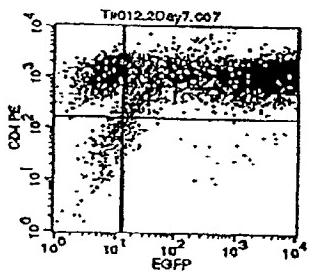
MOI 2
CD4+ EGFP+: 72.7%
MF: 3438



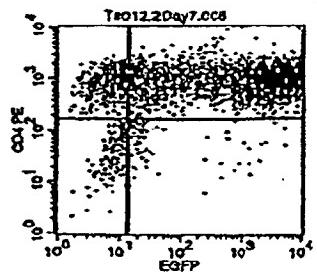
MOI 5
CD4+ EGFP+: 75.4%
MF: 2410



MOI 10
CD4+ EGFP+: 79.7%
MF: 2628



MOI 15
CD4+ EGFP+: 82.4%
MF: 2822



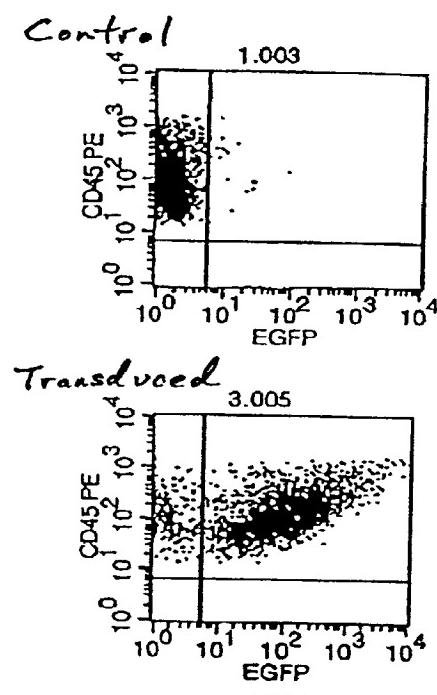
MOI 20
CD4+ EGFP+: 83.8%
MF: 2780

Figure 7

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Figure 8



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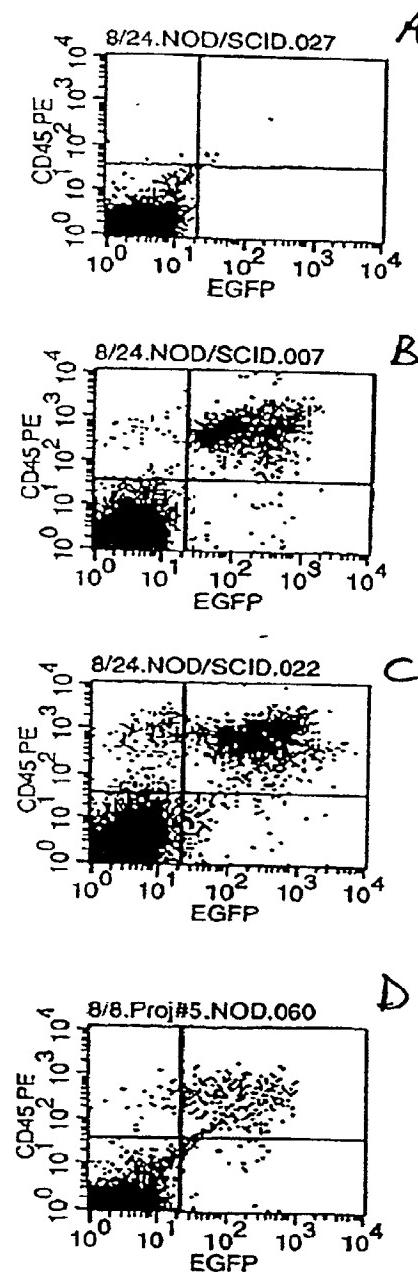


Figure 9

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PCT/US06/19709

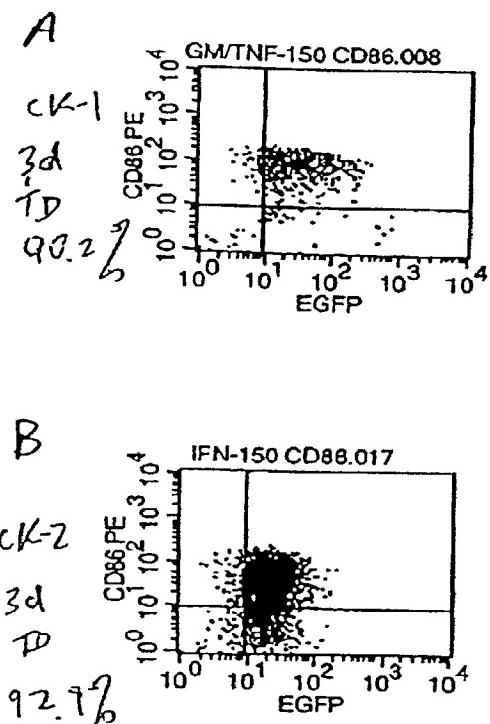


Figure 10

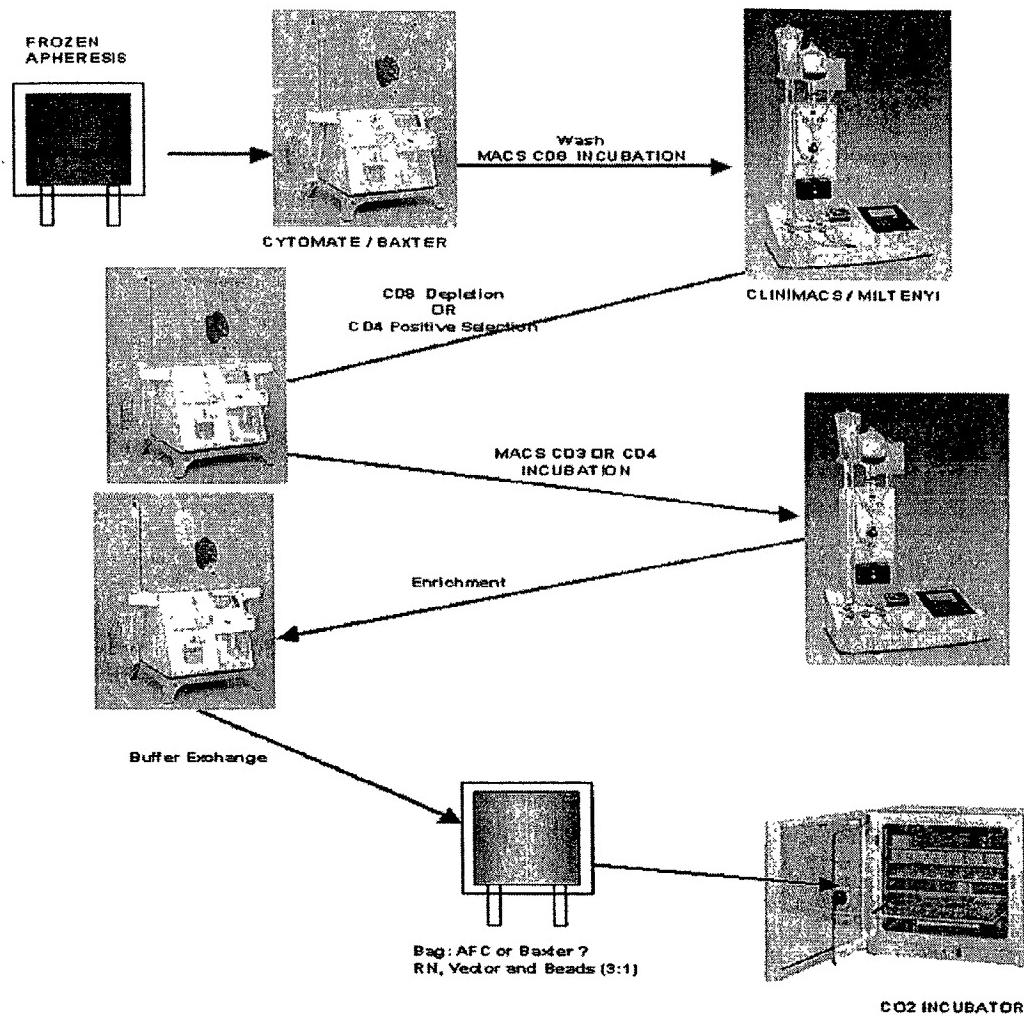


Figure 11

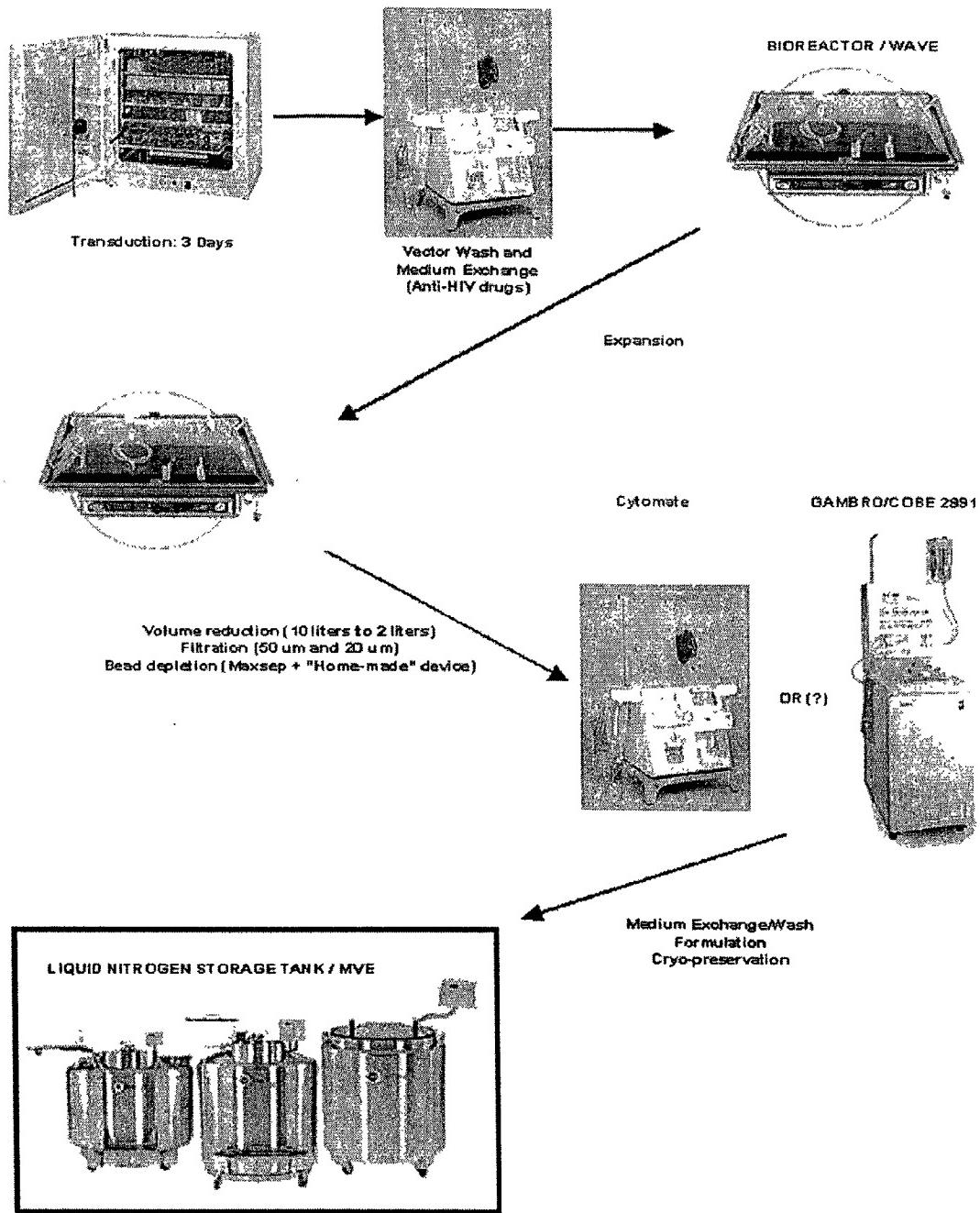
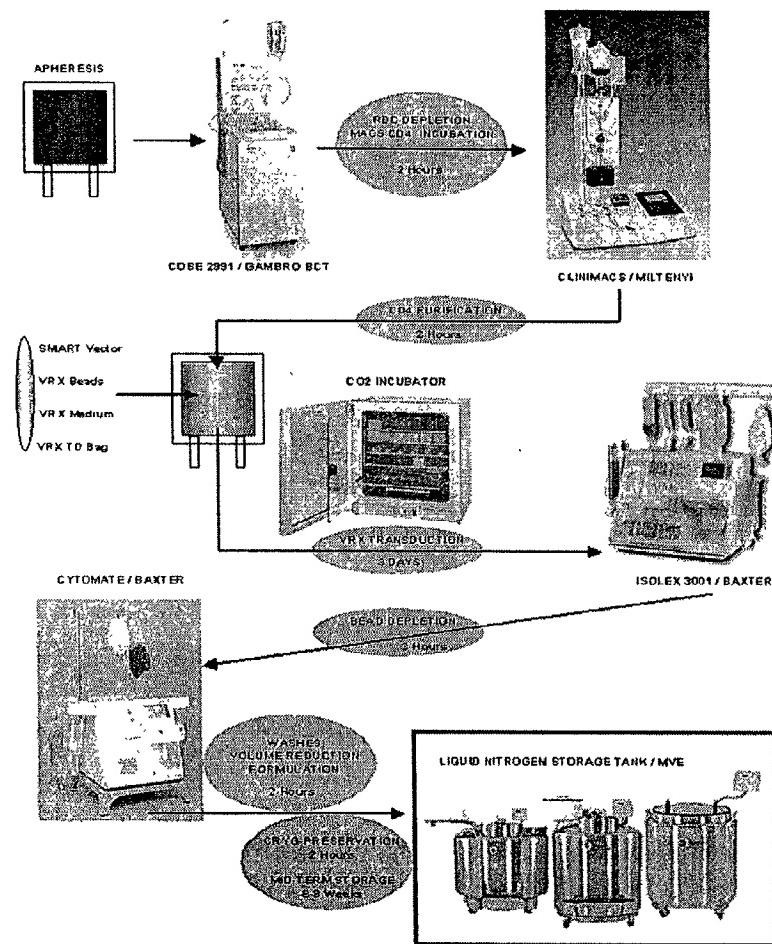
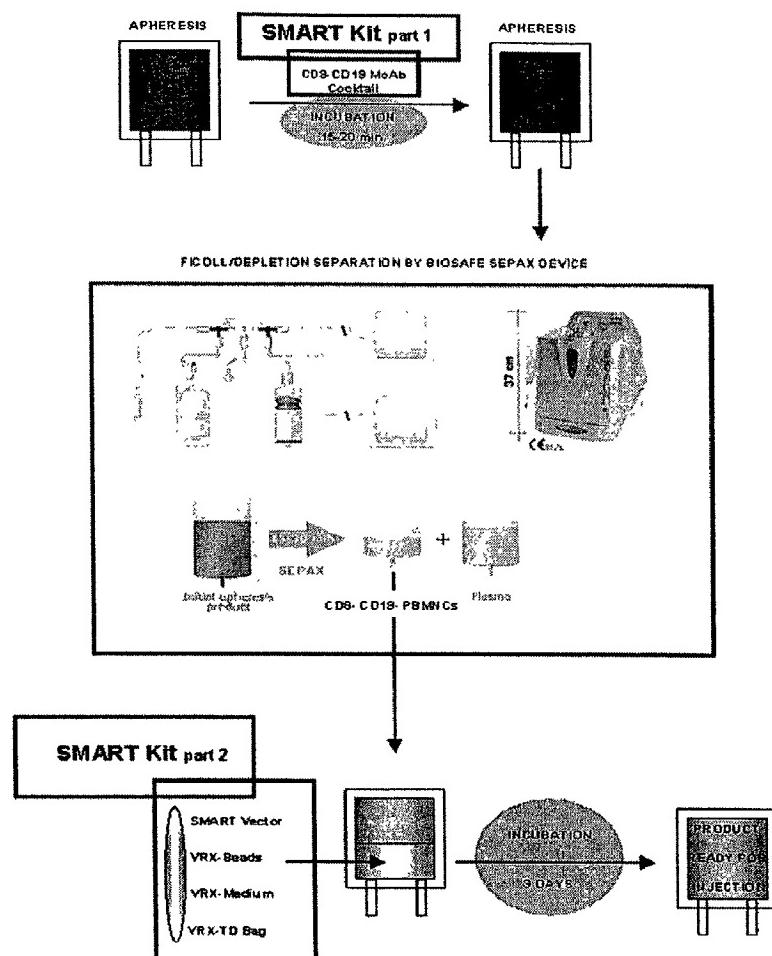


Figure 12

**Figure 13**

**Figure 14**

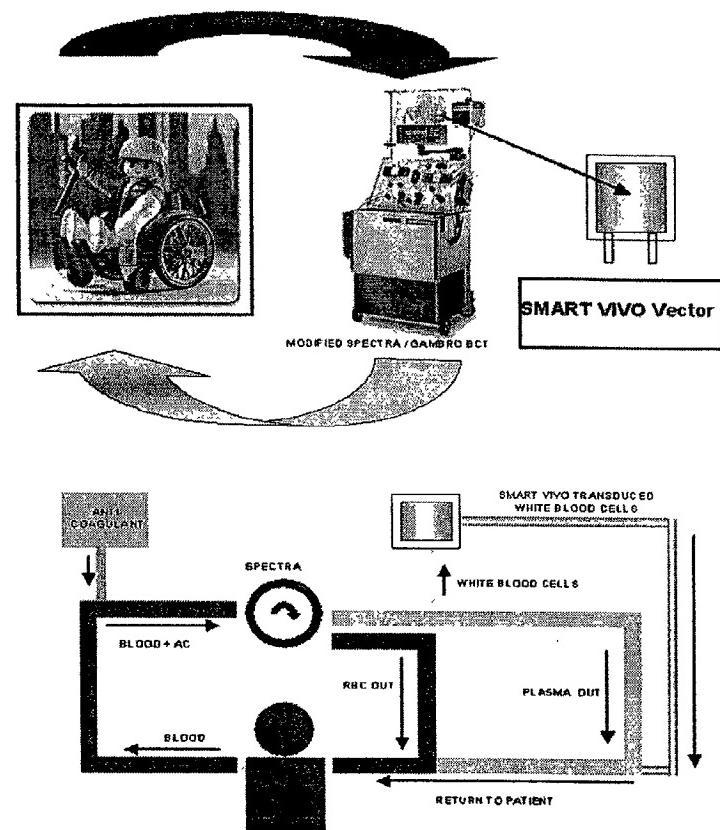


Figure 15

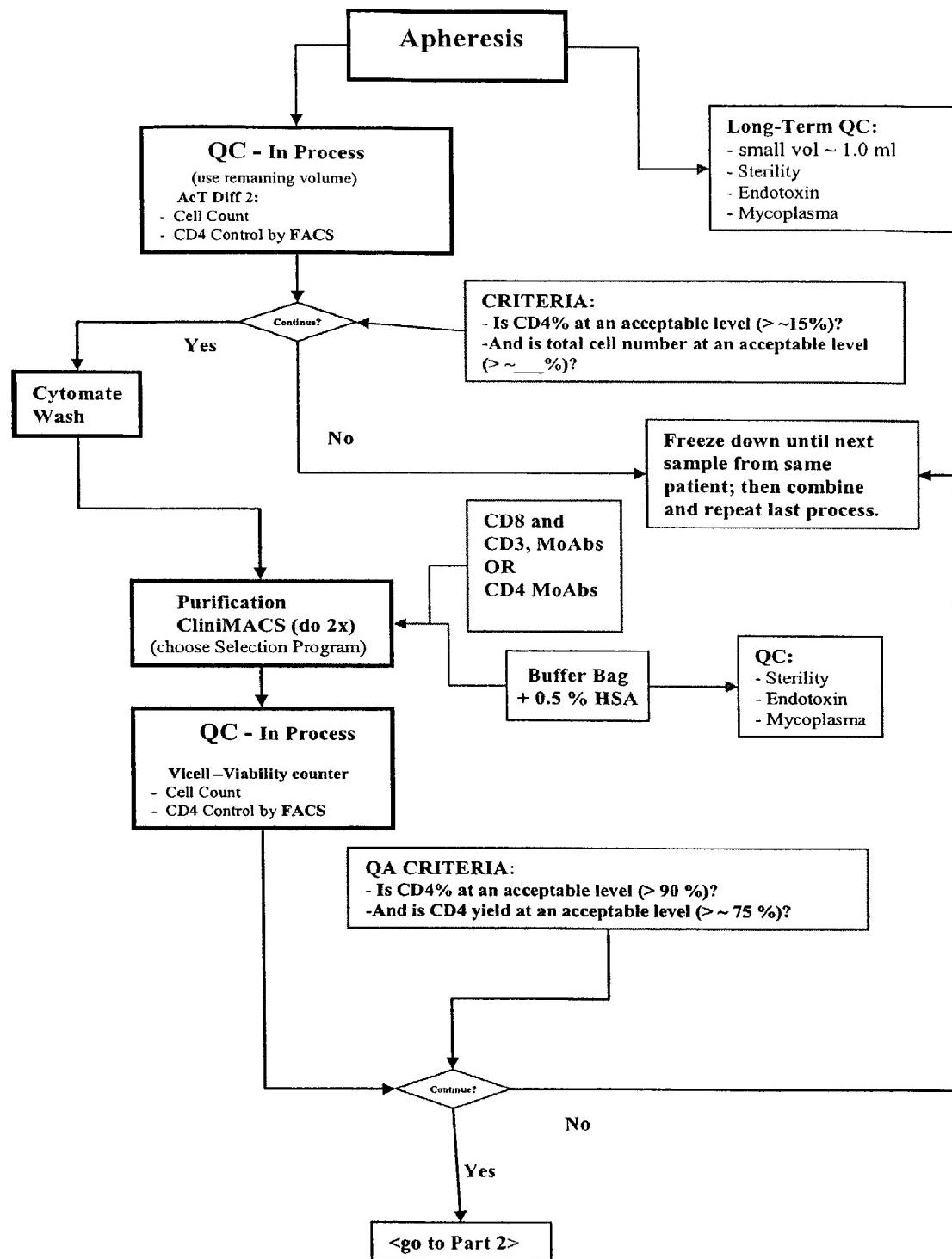


Figure 16A

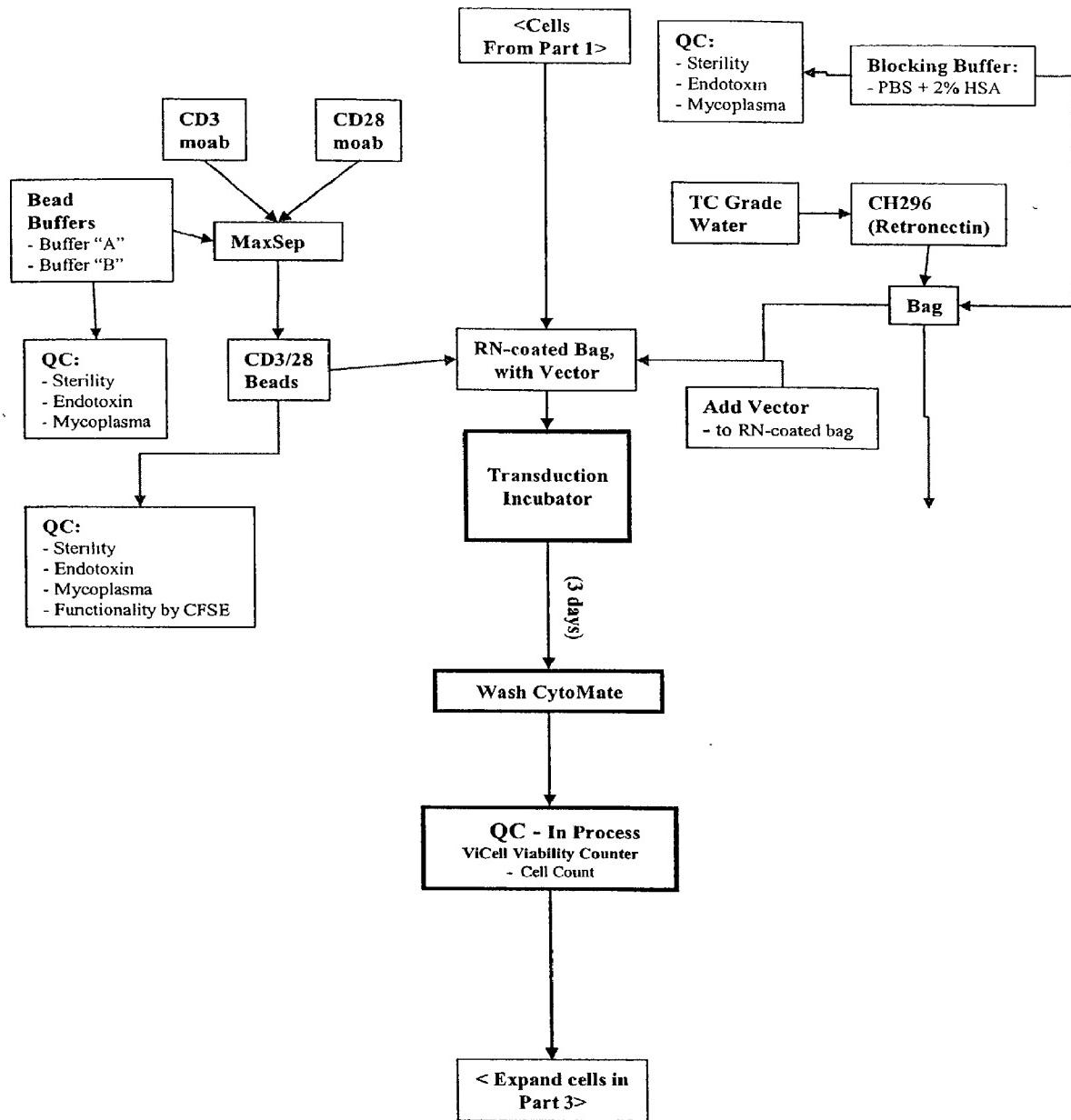


Figure 16B

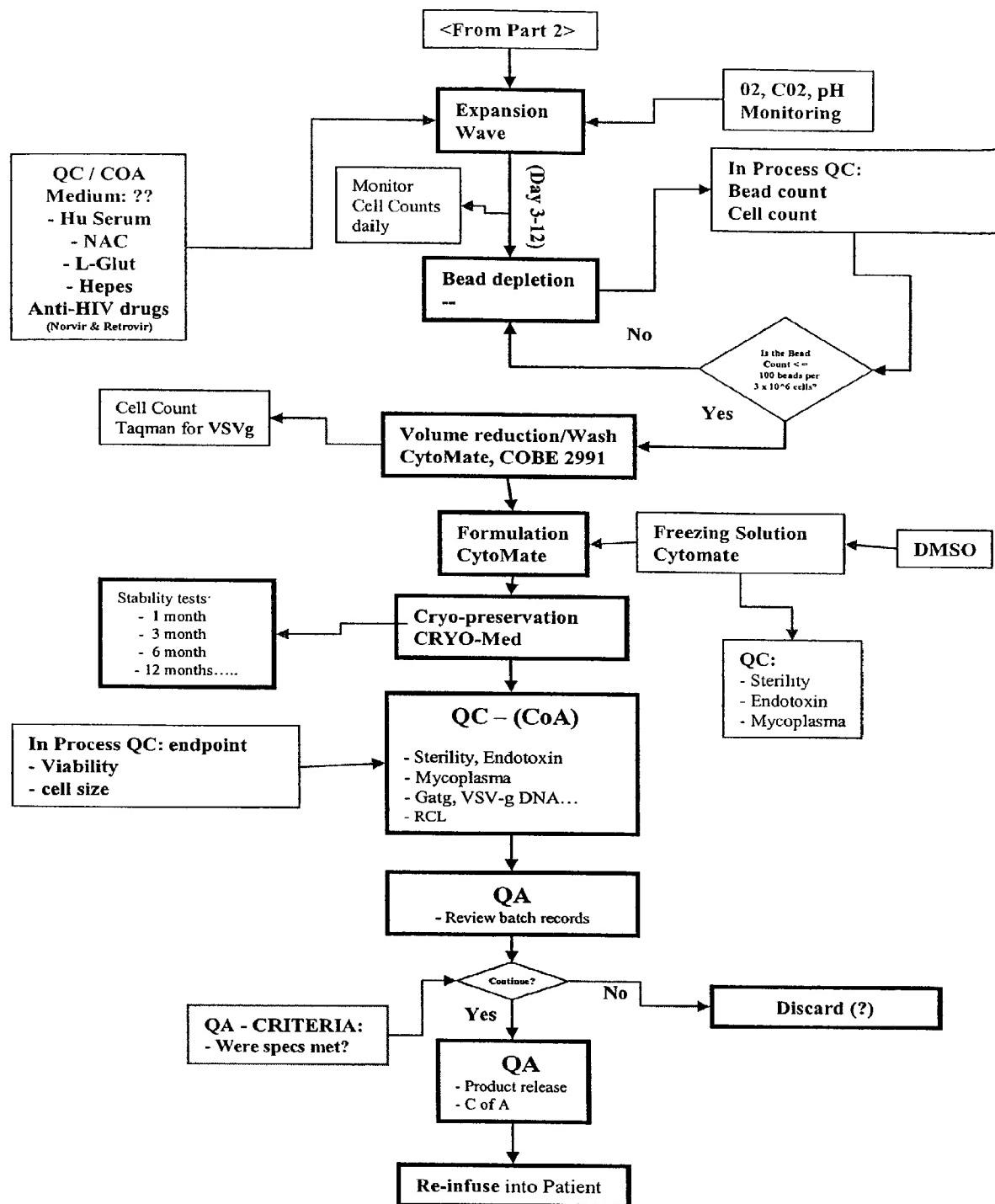


Figure 16C

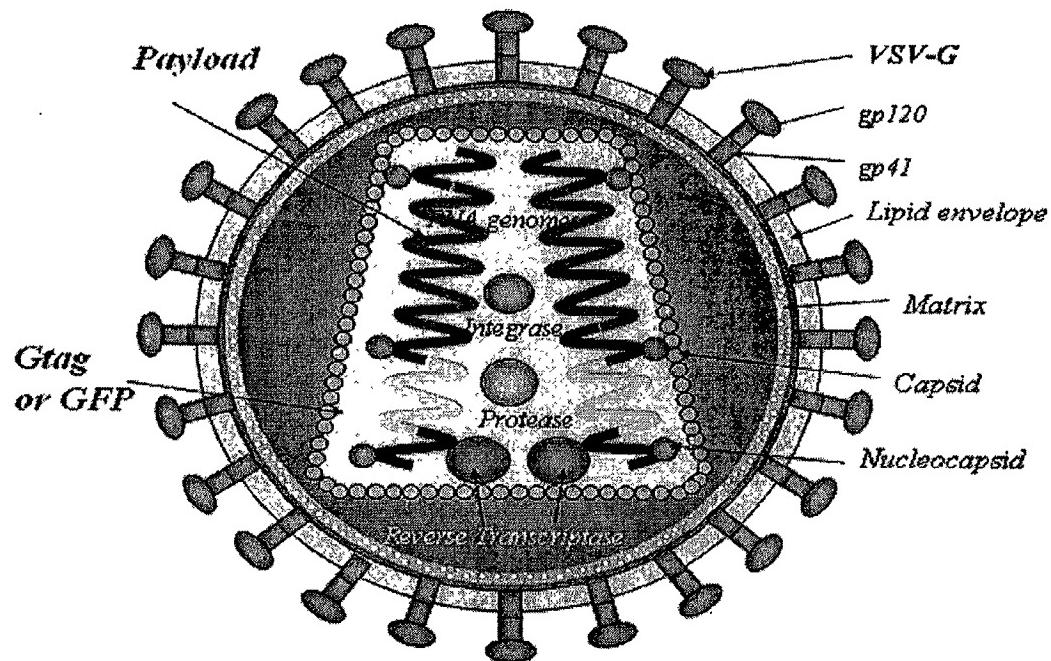


Figure 17

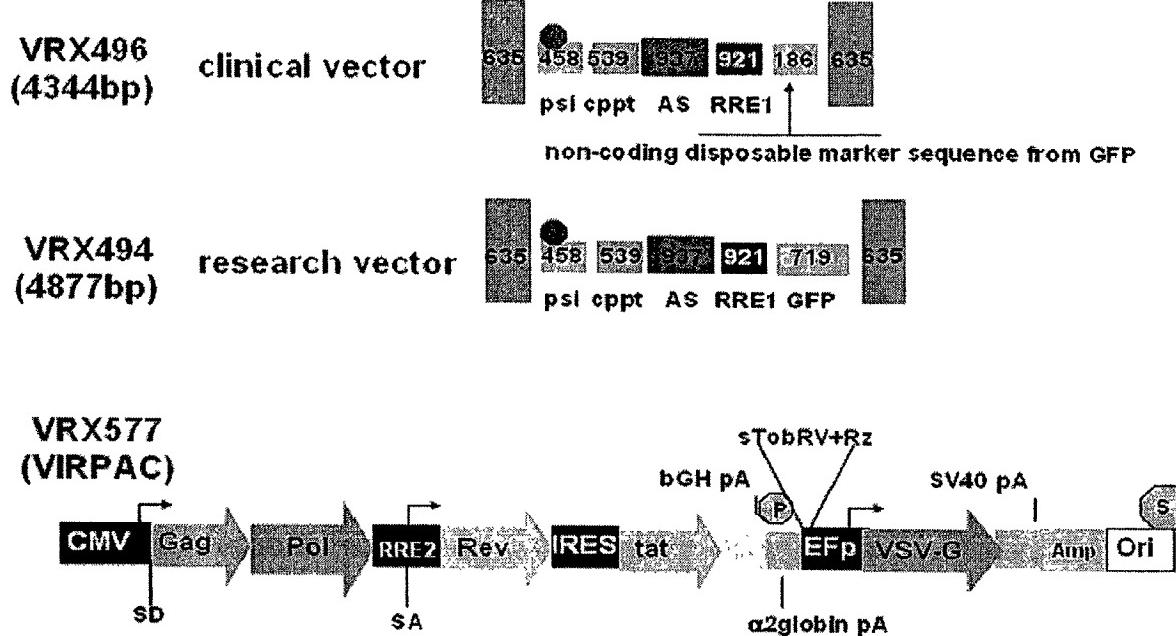


Figure 18

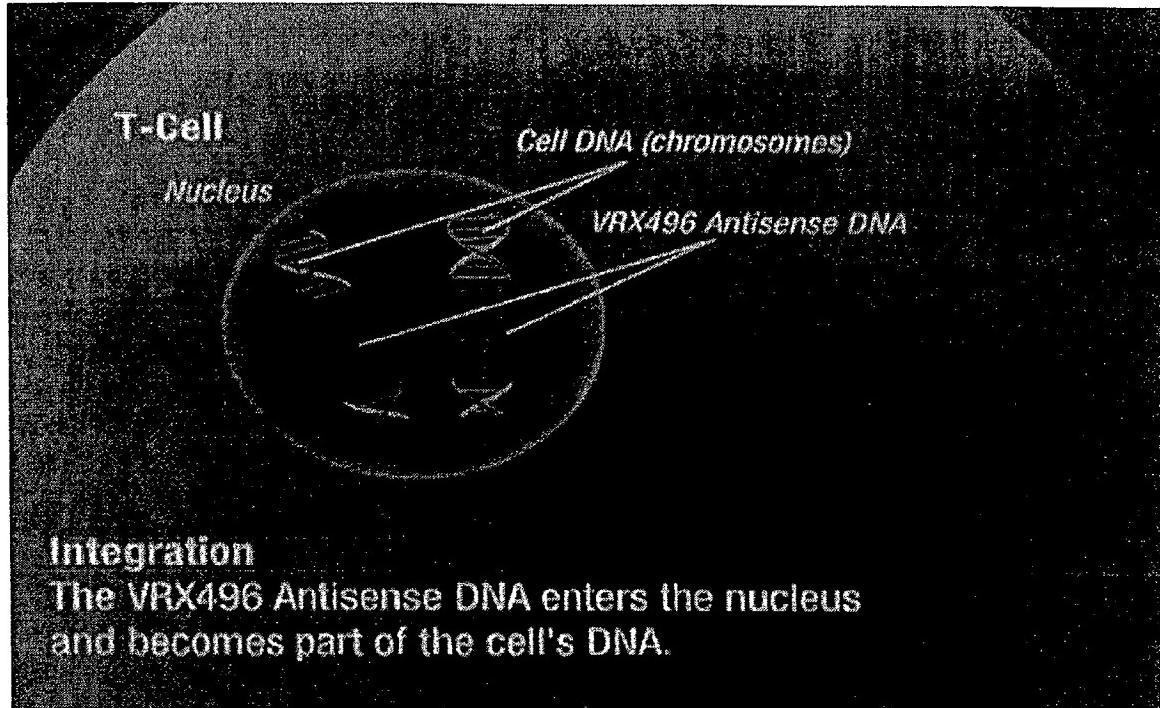


Figure 19

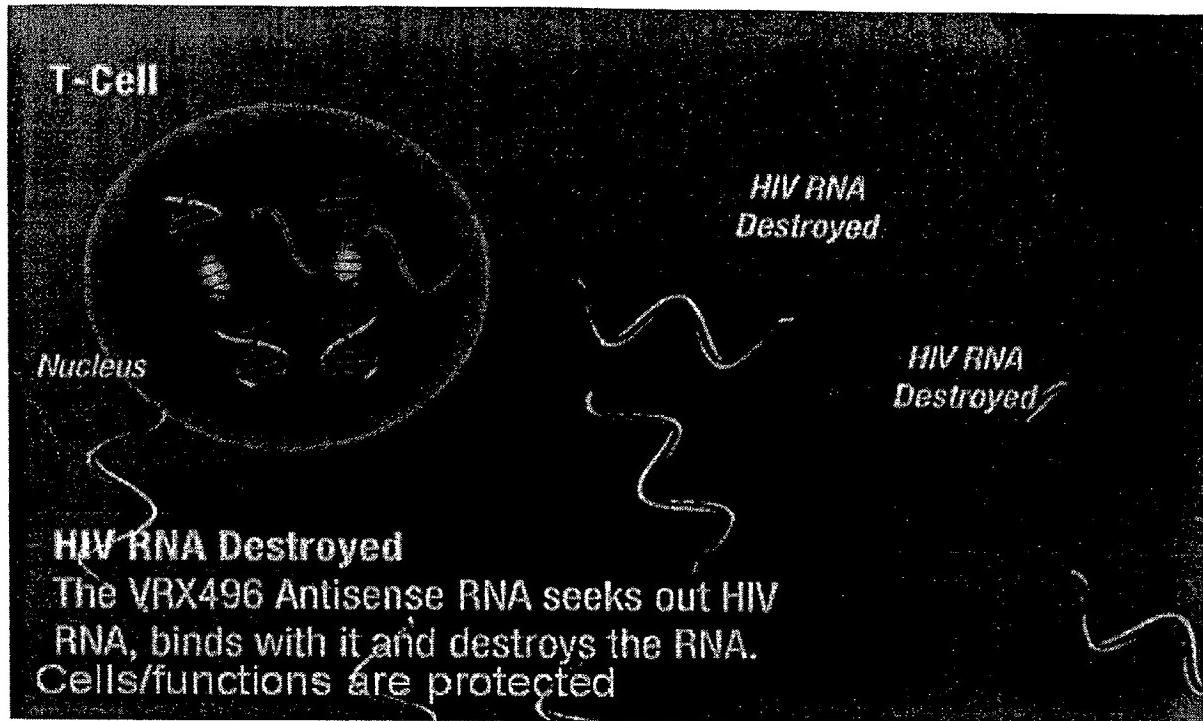
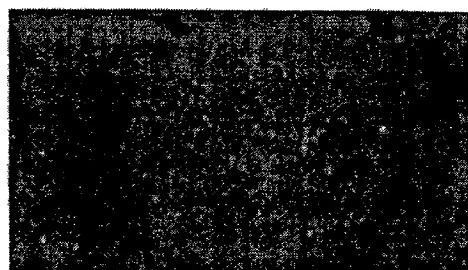


Figure 20

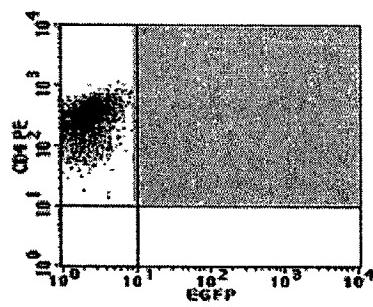
	Number of Mutations Needed for Resistance	Ability to Cause Disease
• Anti HIV drugs – 2-8 binding sites	Small	High
• Long antisense RNA – 937 binding sites	Large	Low

HIV either gets destroyed by antisense or it mutates to levels where the virus is not fit to cause disease

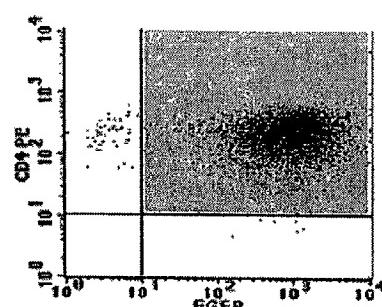
Figure 21



Fluorescent Microscopic View of GFP-expressing vector (Humeau et al. Mol Ther, 2004)



Control



+ vector-EGFP

Figure 22

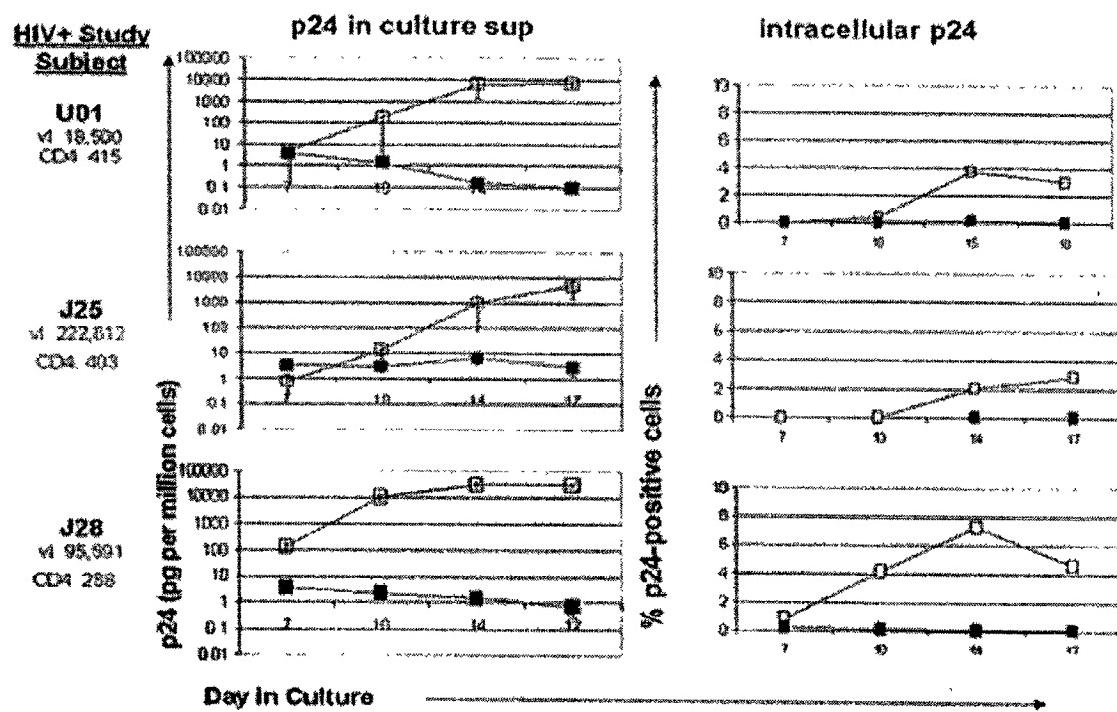


Figure 23

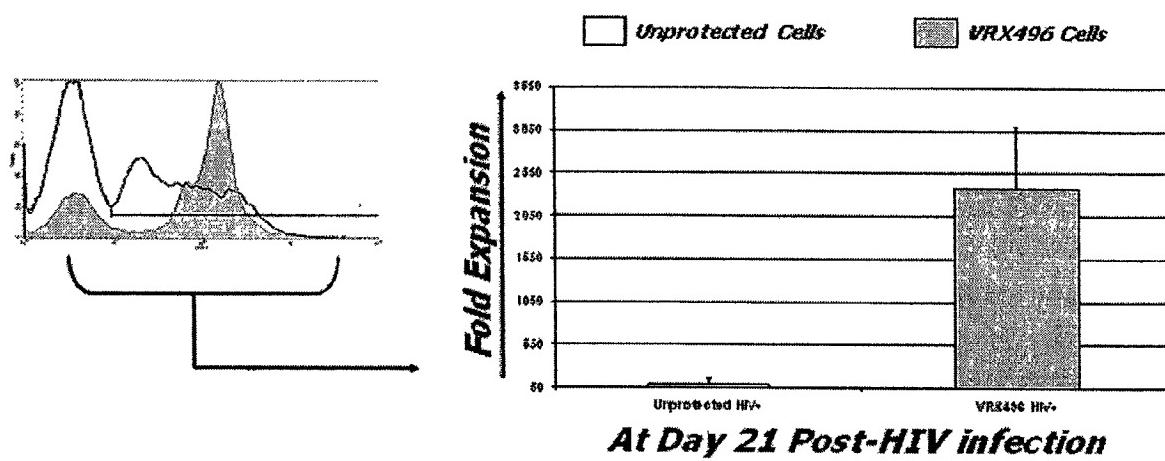


Figure 24

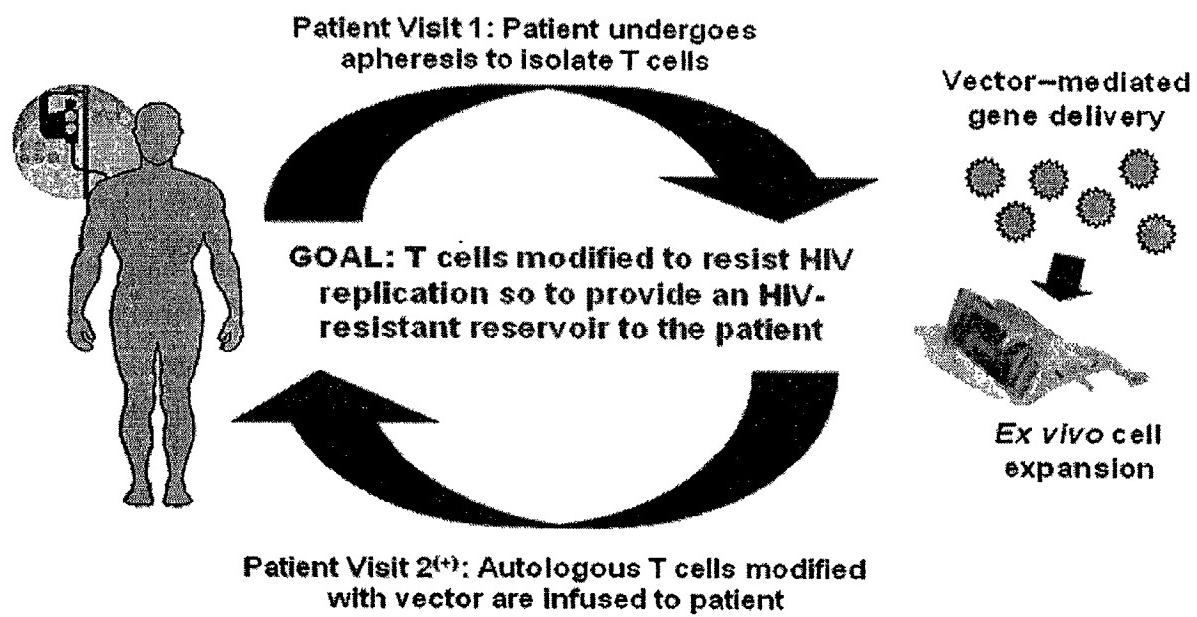


Figure 25

Table 1. Baseline characteristics of HIV subjects

Characteristics	#1 RB	#2 JFJ	#3 RAG	#4 AJ	#5 JF
Age	41	44	40	27	45
Gender	M	M	M	M	M
Ethnic Group	Caucasian	Caucasian	African American	African American	Caucasian
Mean viral load	188,500	54,100	46,150	54,213	19,972
Mean CD4 counts	228	316	241	308	220
HIV Infection (Yrs)	15	15	15	10	9
Discontinued Therapy	6 NRTI +2 NNRTI +5 PI	5 NRTI +4 PI	6 NRTI +1 PI	4 NRTI +2 NNRTI +1 PI	4 NRTI +1 NNRTI +1 PI
Current Therapy	2 NRTI +2 PI	3 NRTI +1 NNRTI +1 PI	None	2 NRTI +1 NRTI	2 NRTI +1 PI

Figure 26

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PCT/US06/19709 on 03/25/2008

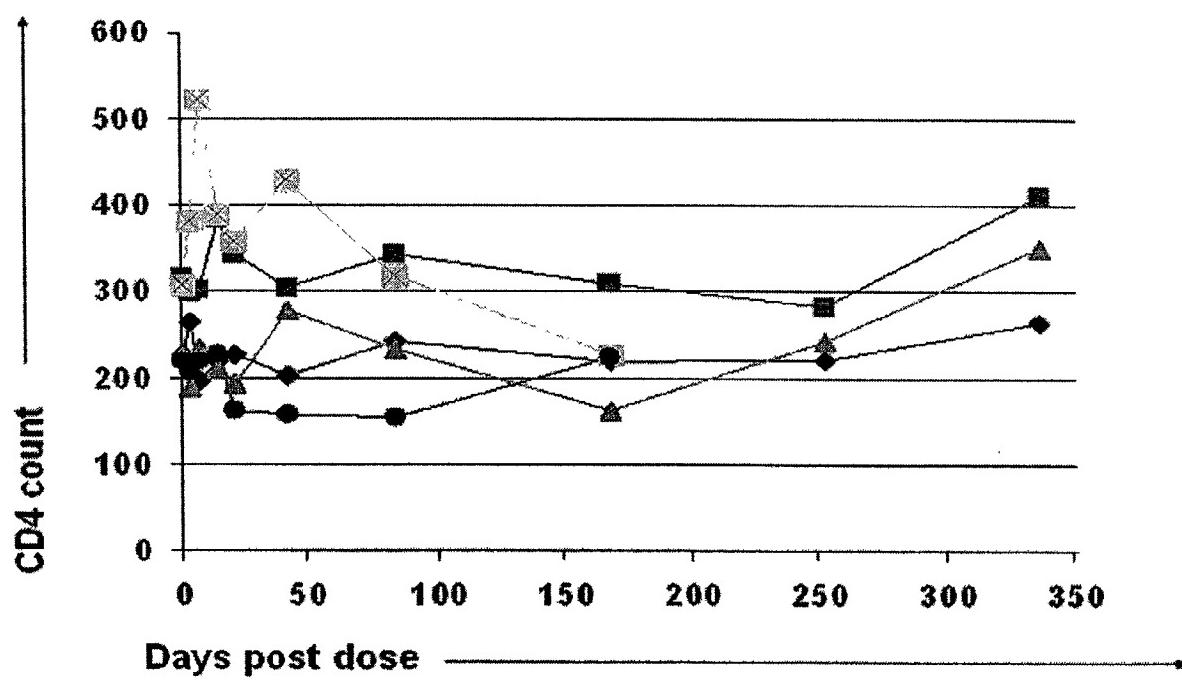


Figure 27

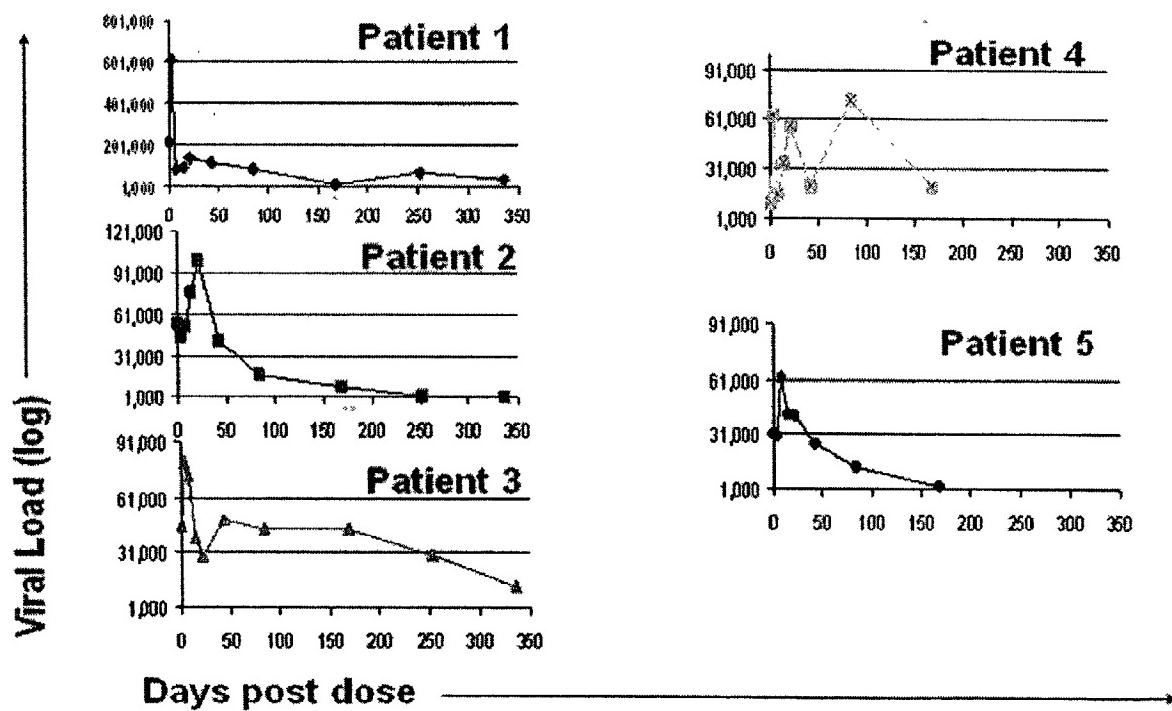


Figure 28

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PCT/US06/19709

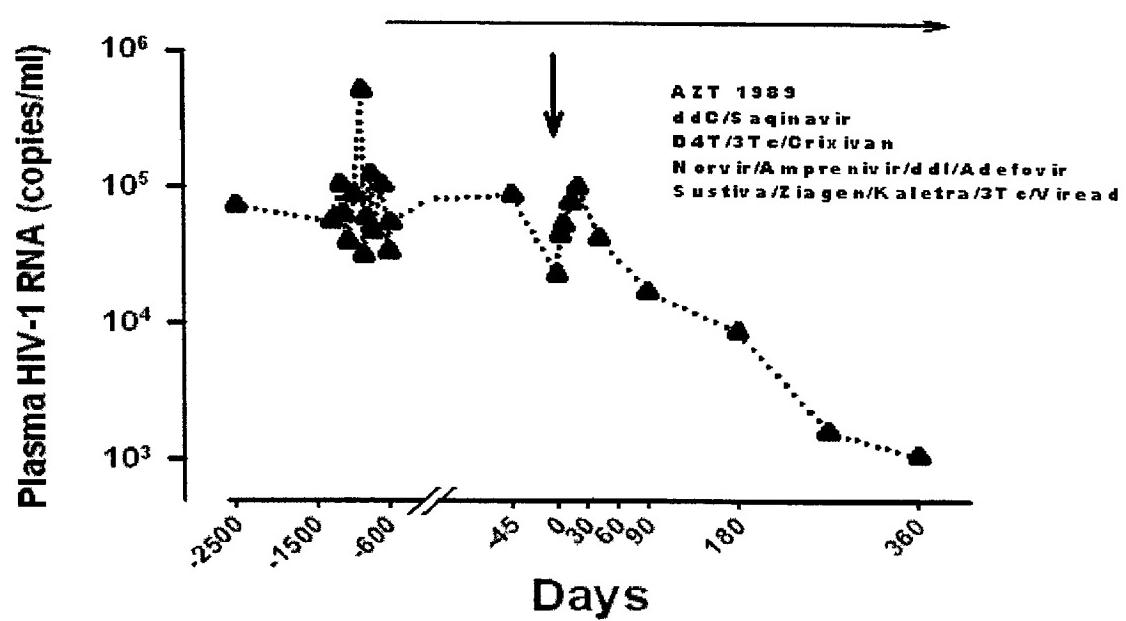


Figure 29

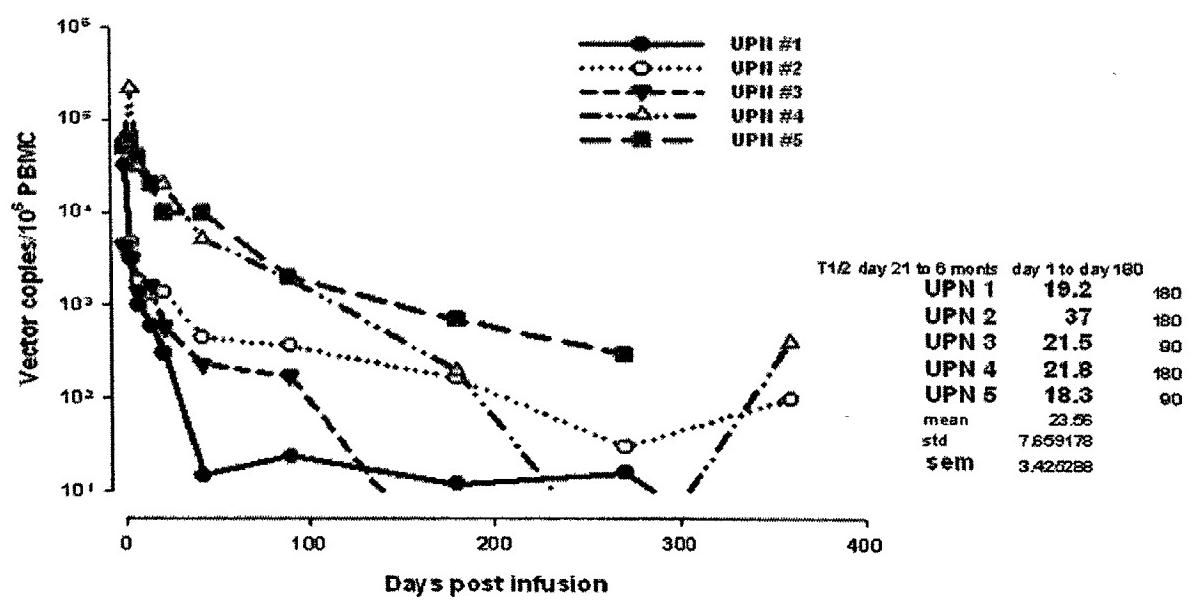


Figure 30

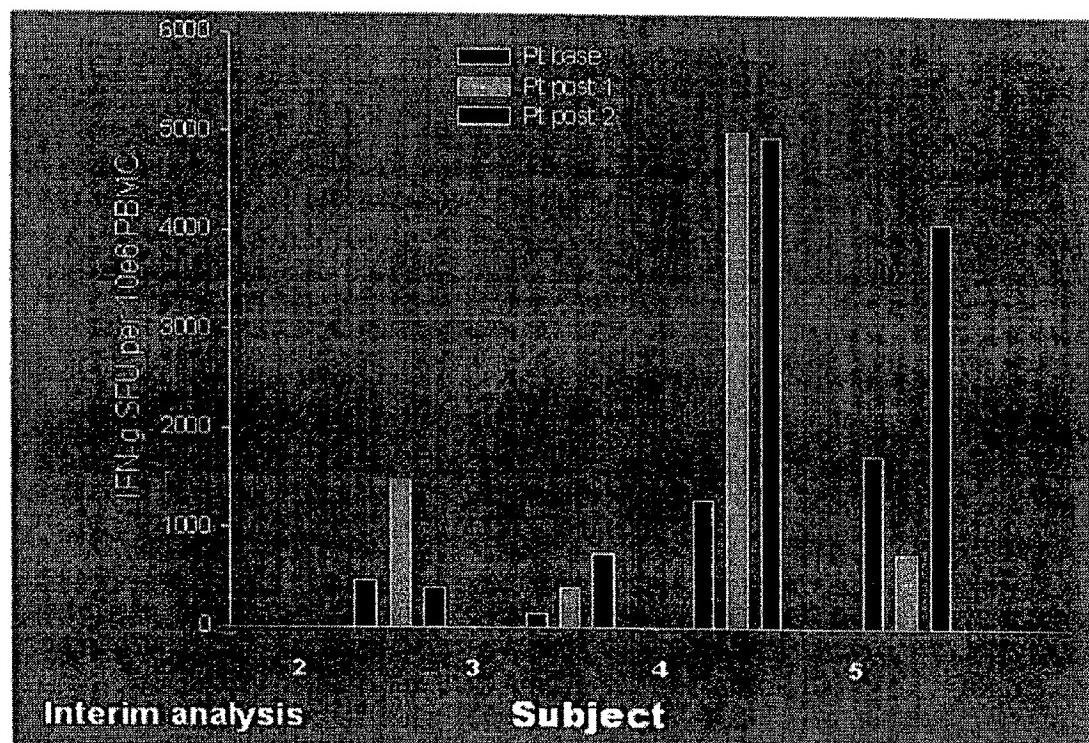
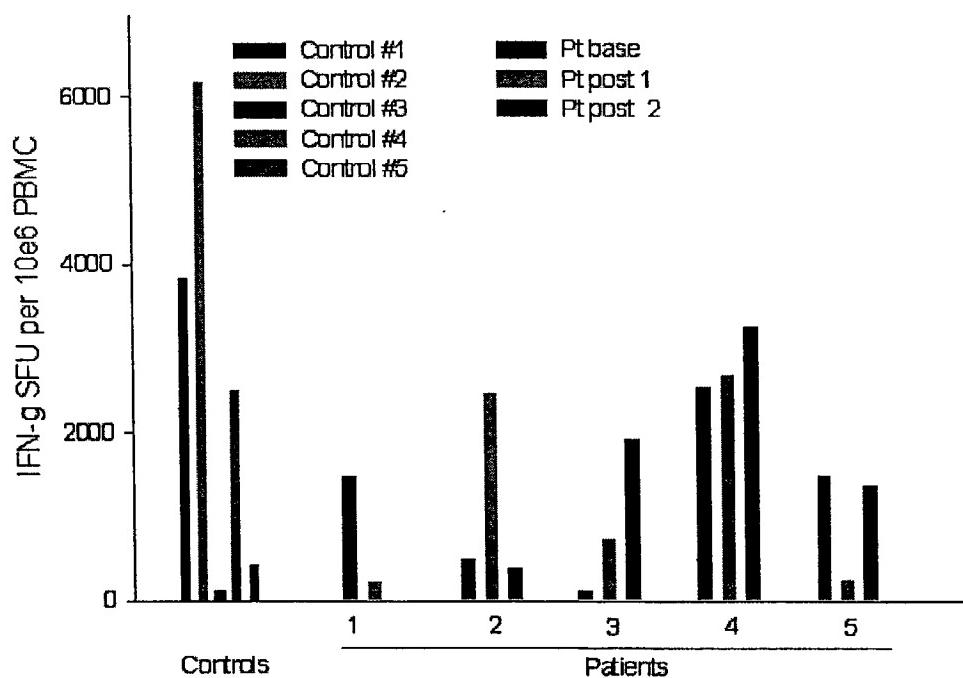


Figure 31

**Figure 32**

Parameter	Phase I Production	Phase II Production
Media	with 10% FBS	with 5% FBS
Transfection	individual cell factory per bag	8 cell factories per bag
Nunc Cell Factories	16	32
Harvest Collections	2	3
Harvest Volume	~35 L	~ 105L
Collections Mode	Individual NCF	8 NCF per bag
Clarification Filters	2 ft ²	5 ft ²
Concentration	~40 fold	~ 100 fold
Chromatography	4 separate 1L columns	2 serially connected 5L columns
Final volume	~1.2 L	~ 2.5 L

Figure 33

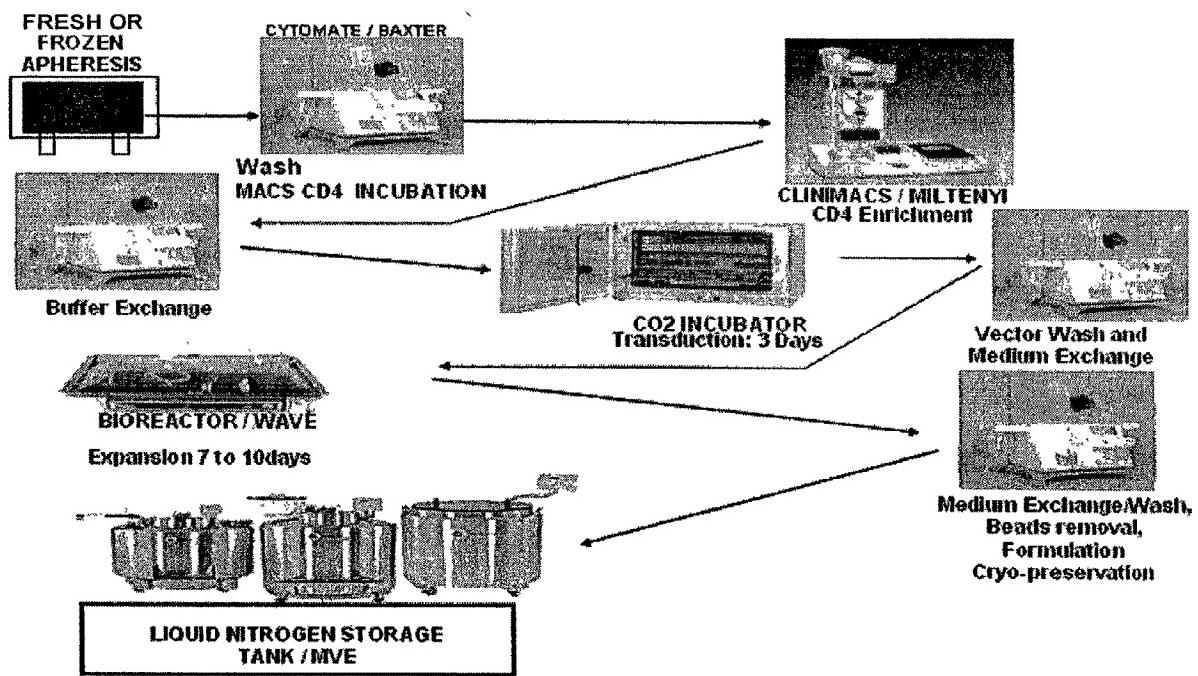


Figure 34

UPenn Phase 1 Cell Product	VIRxSYS Phase 2 Development Lots
CD4+ Cells: 56%, Abs. 3.06×10^8 (52 % recovery)	CD4+ purity: 97.62%, Abs. 3.42×10^9 (47.7% recovery)
CD4+ Cells: 52.2%, Abs. 4.38×10^8 (48% recovery)	CD4+ purity: 97.4%, Abs. 1.48×10^9 (40.5% recovery)
CD4+ Cells: 23%, Abs. 1.67×10^8 (26% recovery)	CD4+ purity: 91.77%, Abs. 2.05×10^9 (48.8% recovery)
CD4+ Cells: 33.4%, Abs. 2.93×10^8 (30% recovery)	
CD4+ Cells: 19.5 %, Abs. 1.77×10^8 (23% recovery)	
Average CD4+ purity: 36.82% (range 19.5-56%)	Average CD4+ purity: 95.6% (recovery 91.77-97.62%)

Figure 35

Phase I Cell Product		Phase II Development Lots	
Subject Study ID	Vector copy number per cell	Process Run #	Vector copy number per cell
001-022 J-K	1.20	1	2.80
001-017 A-J	4.10	2	1.19
001-010 RAG	0.98	3	1.48
001-001 JFJ	1.80		
001-002 R-B	2.3		
Average	2.08		1.82

Figure 36

Phase I Cell Product		Phase II Development Lots	
Subject Study ID	Total Cells / Fold Expansion	Process Run #	Total Cells / Fold Expansion
001-022 J-K	15.8x10 ⁹ / 65	1	52.3x10 ⁹ / 28.6
001-017 A-J	20.6x10 ⁹ / 40	2	104x10 ⁹ / 58.8
001-010 RAG	6.8x10 ⁹ / 25	3	96.6x10 ⁹ / 63
001-001 I-F	11.5x10 ⁹ / 32	4	87.5x10 ⁹ / 63.2
001-002 R-B	15.2x10 ⁹ / 66		
Average	14x10⁹ / 45.6		85.1x10⁹ / 53.4

Figure 37